

CLAIMS

WE CLAIM

1. A method for encoding and decoding digital still images to produce a scalable, content accessible compressed bit stream comprising the steps:
 - decomposing and ordering the raw image data into a hierarchy of multi-resolution sub-images;
 - setting an initial threshold of significance and creating a significance index;
 - determining an initial list of insignificant blocks;
 - forming the list of significant coefficients by encoding a significant map using a quadtree representation;
 - recursively reducing the threshold values and repeating the encoding process for each threshold value; and
 - transmitting refinement bits of significant coefficients.
2. The method defined in claim 1, wherein the hierarchy of multi-resolution sub-images are composed on the basis of a wavelet transformation.
3. The method defined in claim 1, wherein the hierarchy of multi-resolution sub-images are composed on the basis of a Fourier-based transformation.
4. The method defined in claim 1, wherein the hierarchy of multi-resolution sub-images are composed using raw image data.
5. The method defined in claim 1, further comprising the step of a multiplexing protocol that assembles the compressed data from different region and resolution channels into an integrated bit-stream enabling both the encoder and the decoder to selectively and interactively control the bit budget and the quality of the compressed images.
6. An apparatus for encoding and decoding of digital still images that produces a scalable, content accessible compressed bit stream comprising:
 - a means of decomposing and ordering the raw image data into a hierarchy of multi-resolution sub-images;
 - means for setting an initial threshold of significance and creating a significance index;
 - means for determining an initial list of insignificant blocks;
 - means of forming the list of significant coefficients by encoding a significant map using a quadtree representation;

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a means of recursively reducing the threshold values and repeating the encoding process; and

transmitting refinement bits of significant coefficients.

8.7 The apparatus defined in claim 1⁶, wherein the hierarchy of multi-resolution sub-images are composed using a wavelet transformation.

8.9 The apparatus defined in claim 1⁶, wherein the hierarchy of multi-resolution sub-images are composed using a Fourier-based transformation.

10.9 The apparatus defined in claim 1⁶, wherein the hierarchy of multi-resolution sub-images are composed using raw image data.

11.10 The apparatus defined in claim 1⁶, further comprising a multiplexing means that assembles the compressed data from different region and resolution channels into an integrated bit-stream enabling both the encoder and the decoder to selectively and interactively control the bit budget and the quality of the compressed images.

12.11 A method of decoding digital still images to produce a scalable, content accessible compressed bit stream comprising the steps:

decoding the bitstream header;

determining the initial threshold values and the array of initial significant pixels, insignificant bits and wavelet coefficients;

decoding the significance maps;

modifying the significance lists and decoding the refinement bits for each threshold level;

reconstruct the wavelet coefficient array;

perform the inverse wavelet transform; and

reconstruct the image.

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